HW#104: Vertical Motion

Due Date: Friday, May 30th

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ TP: \_\_\_\_\_\_\_

**Failure to show work on all problems will result in a LaSalle.**

**Use the following equation unless given another in the problem.**

**where *t* is the time (in seconds) the object has been in the air, *v* is the initial vertical velocity (in feet per second), and *s* is the initial height (in feet).**

**Round your answers to the nearest hundredth value.**

1) A dog jumps to catch a frisbee with an initial vertical velocity of 10 feet per second.

a) How long until the dog land on the ground?

b) What is the dog’s maximum height?

2) Jessica throws a ball straight into the air at an initial vertical velocity of 30 feet per second. Jessica releases the ball from her waist which is 3 feet high. Alicia also throws a ball straight into the air.at initial vertical velocity of 32 feet per second from her waist which is 2.8 feet high.

a) Write the equation for the ball Jessica threw? Find the maximum height and how long until the ball hits the ground.

b) Write the equation for the ball Alicia threw? Find the maximum height and how long until the ball hits the ground.

c) Which ball reaches a greater height and which ball hits the ground first?

3) A penguin jumps out of the water while swimming. This action is called porpoising. The height *h* (in feet) of the porpoising penguin can be modeled by where *t* is time (in seconds) since the penguin jumped out of the water.

a) Find the zeroes of the function.

b) Explain what the zeroes mean in this situation.

4) Alphonso wanted to play darts with his wife who had no interest in doing so. He threw his dart at an angle parallel to the ground but sadly his dart hit the floor and not the target. At the same exact time he threw his dart she dropped her dart and walked away. Assuming that Alphonso threw the dart from his eye level and she dropped her dart from the same height, do we have enough information to know whose dart hit the ground first? If so, whose dart was it?

5) VANG #2 for both balls on a separate sheet of paper.